Section 435—Rapid Setting Cement Concrete End Dams and Patches

435.1 General Description

This work includes constructing bridge joint end dams and partial or full depth patches in concrete structures. Use rapid-setting cement concrete under these conditions:

- Quick traffic return is required.
- The required minimum depth is 1 in. (25 mm)

435.1.01 Definitions

General Provisions 101 through 150.

435.1.02 Related References

A. Standard Specifications

Section 461—Sealing Roadway and Bridge Joints and Cracks

Section 500—Concrete Structures

Section 504—Twenty-Four Hour Accelerated Strength Concrete

Section 833—Joint Fillers and Sealers

Section 886—Epoxy Resin Adhesives

Section 934—Rapid Setting Patching Materials for Portland Cement Concrete

B. Referenced Documents

General Provisions 101 through 150.

435.1.03 Submittals

A. Mix Design

Submit rapid-setting cement concrete mix designs and materials to the Office of Materials and Research for verification and approval at least 35 days before use.

435.2 Materials

Use these materials to construct bridge joint end dams or repair concrete:

Material	Section
Rapid-setting Cement Material	934
Epoxy Adhesive, Type II	886
Silicone Sealant	461.3.05.C.2 and 833.2.06
Preformed Foam Joint Filler	833.2.10

435.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

435.3 Construction Requirements

435.3.01 Personnel

General Provisions 101 through 150.

435.3.02 Equipment

General Provisions 101 through 150.

435.3.03 Preparation

Prepare the surfaces for construction as follows:

1. Scarify the surface within the repair area using a concrete scabbler to remove unsound concrete and concrete laitance down to sound coarse aggregate.
2. After scarifying the surface, sandblast it to remove loose or unsound concrete or other contaminates.
3. Clean the prepared area with compressed air.
4. Completely coat the bottom and vertical side walls of the prepared area with a film of Type II epoxy approximately 10 to 20 mils (0.25 to 0.50 mm) thick.

435.3.04 Fabrication

General Provisions 101 through 150.

435.3.05 Construction

Repair the bridge joint end dams in the locations or areas indicated on the Plans or as designated by the Engineer.

Remove asphaltic concrete from the end dams areas according to Figure 1 (Figure 1 metric).

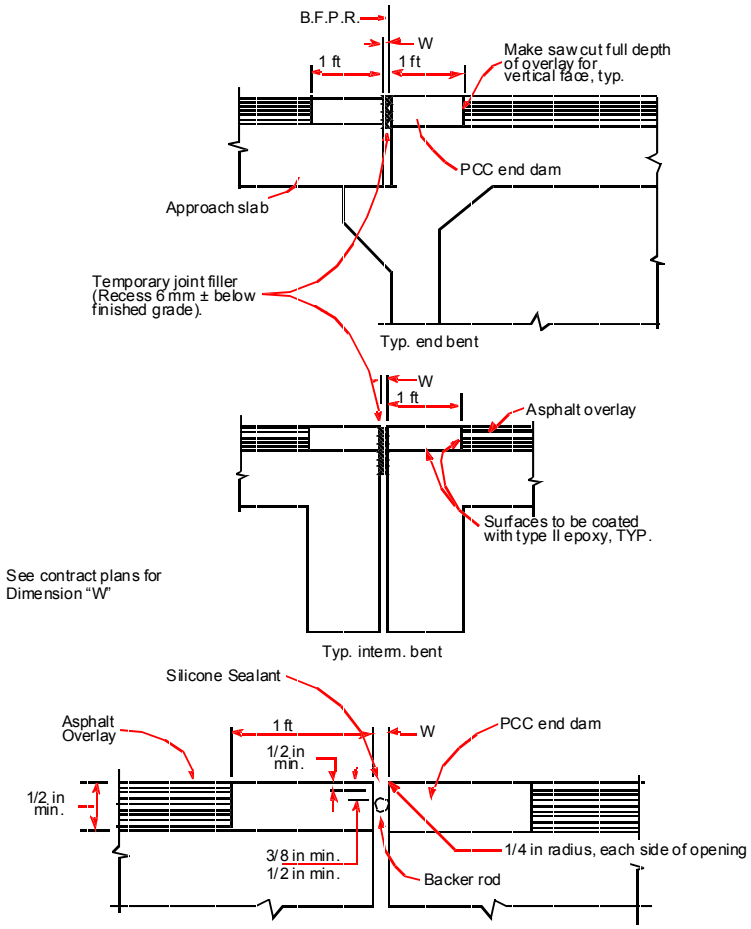

Figure 1

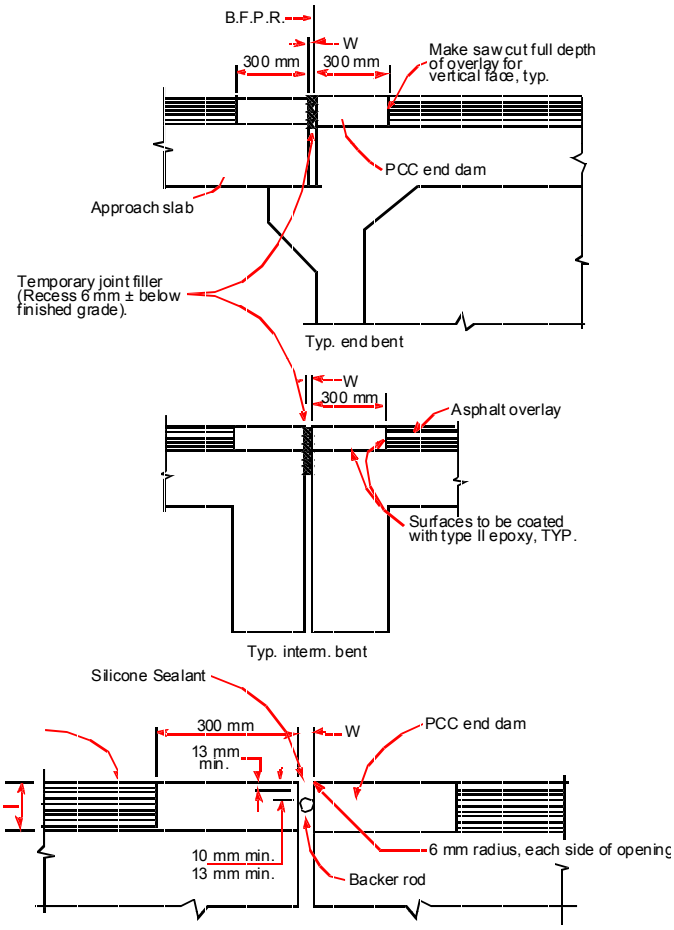

Figure 1 (metric)

A. Weather Limitations

Place rapid-setting cement concrete within the temperature range of 40 ºF to 100 ºF (4 ºC to 38 ºC). Do not apply epoxy bonding adhesive to a damp substrate.

B. Mix Design

Do not use aggregate that is larger than one-quarter the depth of the repair.

C. General Instructions

Handle, mix, place, and finish rapid-setting cement concrete according to the manufacturer's instructions. Ensure that the finished rapid-setting cement concrete surface is the same elevation and cross slope as the adjacent pavement.

D. Placement

Place the rapid-setting cement concrete as follows:

1. Deposit it in the area while the epoxy is still tacky.
2. Vibrate it to completely fill the area of the end dam or patch.
3. Finish the concrete to the proper grade; do not disturb it until the watersheen disappears from the surface.

E. Curing

Cure the rapid-setting cement concrete according to Subsection 500.3.05.Z "Cure Concrete," and as follows:

1. Cure it long enough to develop the concrete strength in place as required in Subsection 435.3.05.G, "Compressive Strength."
2. Use the compressive strength test procedures in Subsection 504.3.06.A, "Compressive Strength Testing," except the Laboratory may reduce the number of test cylinders.

F. Joint Reestablishment

Reestablish the joint as follows:

1. Place temporary joint material that conforms to Subsection 833.2.10 in the joint so to place and screed the full width of the end dams or patches and to bridge the temporary joint material with the screeding apparatus.
2. If patching a joint, reestablish the joint opening to match the existing joint; if constructing an end dam, match the Plan details.
3. Remove the temporary joint material. Sandblast the vertical faces of the joint opening to remove loose material and to produce a coarse texture conducive to bonding sealant.
4. Immediately after sandblasting, seal the opening according to Figure 1 (metric) and Subsection 461.3.05.C.2.

G. Compressive Strength

Do not allow traffic on end dams or patches until the rapid-setting cement concrete obtains a minimum compressive strength of 2,500 psi (15 MPa).

435.3.06 Quality Acceptance

A. Correction of Defects

Remove and replace, at the Contractor's expense, completed end dams or patches that contain cracks, are disbonded from asphalt or slab, or are damaged from construction or traffic before Final Acceptance.

Replace, at the Contractor's expense, silicone joint sealant that fails or that is not within the depth tolerances of Figure 1 (Figure 1metric).

435.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

435.4 Measurement

The area measured for payment is the rapid-setting cement concrete in cubic feet (meters) used in bridge joint end dams or patches completed in place and accepted.

435.4.01 Limits

General Provisions 101 through 150.

435.5 Payment

The joints measured will be paid for at the Contract Unit Price per cubic foot (meter) for bridge joint and end dams, and per cubic foot (meter) for patches. Payment is full compensation for:

- Sawing as required
- Removing the asphaltic concrete material or spalled, broken, or damaged Portland Cement Concrete
- Cleaning the substrate by sandblasting or abrading and planing
- Mixing, placing, finishing, and curing the concrete
- Providing equipment, tools, and labor
- Performing incidentals to complete the work, including sealing the joints

Payment will be made under:

Item No. 435	Rapid-setting cement concrete bridge joint end dams	Per cubic foot (meter)
Item No. 435	Rapid-setting cement concrete patching Portland cement concrete	Per cubic foot (meter)

435.5.01 Adjustments

General Provisions 101 through 150.

Section 436—Asphaltic Concrete Curb

436.1 General Description

This work includes constructing asphaltic concrete curbs according to these Specifications. Construct curb that conforms to the lines and grades shown on the Plans or established by the Engineer.

436.1.01 Definitions

General Provisions 101 through 150.

436.1.02 Related References

A. Standard Specifications

Section 400—Hot Mix Asphaltic Concrete Construction

Section 413—Bituminous Tack Coat

Section 802—Aggregates for Asphaltic Concrete

Section 820—Asphalt Cement

B. Referenced Documents

GDT 7

GDT 66

GDT 115

436.1.03 Submittals

General Provisions 101 through 150.

436.2 Materials

Ensure that materials meet the requirements of Section 802, Section 820, and Section 828.

Use a uniform, homogeneous asphalt mixture of aggregate and bituminous material. A job mix formula is not required; however, base the mixture on an approved design analysis that meets the requirements of either a 4.75 mm mixture or 9.5 mm Superpave mixture (Level A) as described in Section 828 except that testing for moisture susceptibility, GDT 66 and rutting susceptibility, GDT 115, will not be required. The asphalt content for asphaltic concrete curb shall be set 1.0% higher than the optimum asphalt content determined during the mix design analysis. Control the mixture within the mixture control tolerances for the respective mix given in Section 828. Do not continue operation outside the mixture control tolerances.

436.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

436.3 Construction Requirements

436.3.01 Personnel

General Provisions 101 through 150.

436.3.02 Equipment

Use equipment that meets the requirements in Section 400 for mixing and transporting the asphaltic concrete.

A. Self-Propelled Curbing Machine

For curb construction, use an approved self-propelled curbing machine equipped with:

- A hopper
- A power-driven screw or other device that forces the mixture through a tube and then through a die attached to the tube